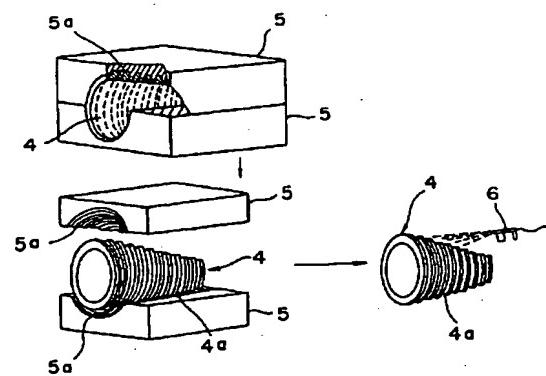


第2図



PF020130
US

Japanese Kokai Patent Application No. Sho 59[1984]-107607

Job No.: 228-102549

Ref.: JP 59-107607/PF020130 US/BJC/#6761

Translated from Japanese by the Ralph McElroy Translation Company
910 West Avenue, Austin, Texas 78701 USA

JAPANESE PATENT OFFICE
PATENT JOURNAL (A)
KOKAI PATENT APPLICATION NO. SHO 59[1984]-107607

Int. Cl.³: H 01 Q 13/02

Sequence No. for Office Use: 7741-5J

Filing No.: Sho 57[1982]-218166

Filing Date: December 13, 1982

Publication Date: June 21, 1984

No. of Inventions: 2 (Total of 3 pages)

Examination Request: Not filed

DIELECTRIC CORRUGATED HORN AND MANUFACTURING METHOD THEREOF

Inventor: Yasuhide Kaneko
NEC Corp.
5-33-1 Shiba, Minato-ku, Tokyo

Applicant: NEC Corp.
5-33-1 Shiba, Minato-ku, Tokyo

Agent: Toshiyoshi Somekawa, patent
attorney

[There are no amendments to this patent.]

Claims

1. A type of dielectric corrugated horn characterized by the fact that it has a hollow dielectric member with a corrugated groove portion formed in its outer peripheral surface and a metal film formed on the outer peripheral portion of said dielectric member.
2. A method for manufacturing a dielectric corrugated horn, characterized by the following facts: a dielectric corrugated horn feed member having corrugated groove portion in its outer periphery is formed by means of a split mold with a corrugated groove portion formed in its inner wall; metal flame spraying or aggregation is then performed on the outer periphery of said corrugated horn feed member.

Detailed explanation of the invention

The present invention pertains to a type of corrugated horn that can be used as the primary radiator of a Cassegrain antenna, and its manufacturing method.

In the prior art, said corrugated horn is manufactured as follows: A tapered hollow member is manufactured by casting a metal or by hollowing a round aluminum rod. The desired corrugated groove portion is then cut on its inner periphery on a lathe. Because of the tapered shape of the inner diameter in the axial direction, it is very difficult in this method to perform processing to achieve the depth and width of the corrugated groove portion on the inner periphery, and the manufacturing efficiency is very poor so that it is inappropriate for mass production. With regard to cost, this scheme is expensive. In addition, because it is formed as a single aluminum member, it is heavy. This is undesirable.

The purpose of the present invention is to solve the aforementioned problems of the prior art by providing a type of dielectric corrugated horn that is lightweight and is appropriate for mass production.

Another purpose of the present invention is to provide a method for manufacturing said dielectric corrugated horn inexpensively using a forming mold.

The present invention provides a type of dielectric corrugated horn characterized by the fact that it has a hollow dielectric member with a corrugated groove portion formed in its outer peripheral surface and a metal film formed on the outer peripheral portion of said dielectric member. Also, the present invention provides a method for manufacturing said dielectric corrugated horn, characterized by the following facts: fiber reinforced plastic (FRP) is laminated on the inner side of a split mold with a corrugated groove portion formed in its inner wall to form a horn feed member; the formed horn feed member is then detached from said split mold; metal flame spraying or aggregation is then performed on the outer periphery of said corrugated horn feed member. As a result, the corrugated horn can be manufactured easily without cutting or other machine processing.

In the following, an application example of the present invention will be explained with reference to figures.

Figure 1 is a schematic diagram illustrating the process of manufacturing a corrugated horn in the prior art. In the prior art, a round aluminum rod (1) is processed by cutting it with cutting bit (3) on a NC lathe or the like to form the desired corrugated hole (2a). As a result, corrugated horn (2) is manufactured. In this method, the outer peripheral end portions of said round aluminum rod (1) must be chucked in the lathe so that the rod can be rotated to cut the tapered grooved hole. Consequently, it takes a lot of time to set the groove depth, groove width, and other dimensions.

Figure 2 is a schematic diagram illustrating the process flow in an application example of the manufacturing method of the present invention. First of all, split mold (5) with the desired corrugated groove portion (5a) in its inner peripheral wall is prepared. A dielectric material such as FRP is laminated onto the inner wall of said split mold (5). As a result, dielectric corrugated horn feed member (4) is formed with corrugated groove portion (4a) corresponding to said inner grooves in said mold. After split mold (5) is separated and said corrugated horn feed member (4) is detached from the mold, aluminum metal flame spraying is performed with flame spraying nozzle (6) on corrugated groove portion (4a) on the outer wall of the feed member. As a result, a metal film of aluminum is formed on the outer periphery of the feed member. This metal film acts to shield leakage of the electromagnetic waves passing through the hollow portion of the dielectric horn feed member. Consequently, the corrugated horn can serve the function of a primary radiator. Also, the dielectric material for use in the present invention is not limited to FRP. Other appropriate dielectrics can also be used. Also, the metal film formed on the outer periphery is not limited to aluminum. Other metals may be used for flame spraying, vapor deposition or aggregation.

As explained above, by forming the desired corrugated groove portion on the outer periphery of the horn according to the present invention, it is possible to manufacture it with a forming mold. Because mold processing is used, products of the same type can be mass-produced. As a result, the production efficiency is increased, and the unit price can be lowered. The corrugated horn obtained is also much lighter than the monolithic metal corrugated horns manufactured in the prior art by cutting or casting.

Brief description of the figures

Figure 1 is a schematic diagram illustrating the process of manufacturing the corrugated horn in the prior art. Figure 2 is a schematic diagram illustrating the manufacturing process in an application example of the present invention.

- 4 Dielectric corrugated horn feed member
- 4a Corrugated groove portion in the outer periphery of the feed member
- 5 Split mold
- 5a Corrugated groove portion in the inner wall of the mold
- 6 Aluminum flame spraying nozzle

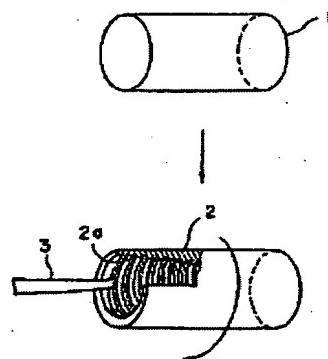


Figure 1

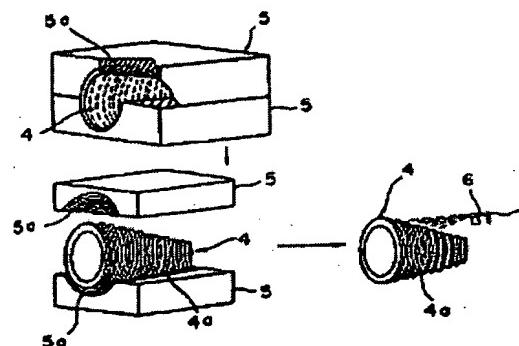


Figure 2